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ABSTRACT

This paper provides information about and commentary on advances made in the understanding and treatment of cognitive dysfunction. Under discussion is the profession's role in the interdisciplinary teamwork at rehabilitation facilities, specifically the Baylor (Texas) Institute for Rehabilitation. Baylor features a serial assessment schedule in which patients are returned to the rehabilitation facility at intervals of 6 weeks, 6 months, and 1 year post hospital discharge for increasingly more sophisticated neuropsychological assessment. Five categories of suggestions are offered regarding the validity of treatment effects. A description of the components of the head trauma program covers early, middle, and late phases. (CL)

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# NEUROPSYCHOLOGY'S ROLE IN AN OBJECTIVE INTERDISCIPLINARY TREATMENT MODEL

by

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In October of 1980, while delivering a seminar lecture to a group of students at the Universitaet von Bielefeld in the Republic of West Germany (Hopewell, 1981), I was asked by a group of psychology students to describe in detail cognitive remediation techniques for brain injured patients. The Universitaet von Bielefeld at that time was in the process of establishing a rehabilitative center and had hired trained neuropsychologists from the United States to aid in their overall treatment program development. The students were quite disappointed and frustrated because I was unable to describe any completely validated technique which was guaranteed to improve cognitive functioning in brain injured individuals. After all, they had invested a significant amount of money, time, and other resources to their rehabilitation center. Certainly a neuropsychologist who was the director of the European Neuropsychological Laboratory for the United States Army and had been trained at the Medical Branch in Galveston could advise them on how best to remediate the cognitive disorders of their patients!

Five years later the same question was again raised, not by graduate students, but by a significant number of eminent members of the International Neuropsychological Society at the Eighth European Conference of the INS in Copenhagen. Indeed, the number of rehabilitation programs addressing cognitive issues, the number of cognitively impaired individuals surviving for significant periods of time, amount of money frequently committed by third party payers, and the scientific interest in this issue has increased to such a substantial level that not only was this a primary issue of consideration of the conference but serious consideration was given to forming a separate task force or conference meeting to address only the specific issue of treatment validaton.

* Special acknowledgement is given to Jami Heupel, M.A. for her contributions to this work.

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Although it remains true today that there is a lack of well validated treatment methods in the entire field of cognitive remediation, we have made some progress in the field of clinical neuropsychology in both the understanding and treatment of cognitive dysfunction. After all, it is still quite difficult to teach children with relatively normal brains as well as those with learning disabilities the basic academic skills. Why shouldn't it be harder still to address the remediation of an ill or injured brain?

As the field of clinical neuropsychology has developed over the past several years as a recognized specialty with well recognized training and board certification procedures, the responsibility placed upon the profession has also grown. No longer is the emphasis on questions of lesion localization viz. ("Is the area which is relatively more damaged in the left or right cerebral hemisphere?") An increasing emphasis is placed upon the profession to answer questions of a functional analysis of overall brain behavior relationships, to contribute to an understanding of brain processes to the overall functional cognitive and personality issues, to participate as program developers for treatment intervention, and to be integrally involved in researching the validity of those interventions. Rourke (1982), for example, has already suggested that the prediction of "everyday" life functioning in terms of rehabilitation programs will supplant neurodiagnosis as the major application of modern neuropsychology.

Neuropsychologists are currently being recruited in ever greater numbers by rehabilitation facilities to be integral team members and provide input into direct program development for the overall rehabilitative milieu. However, as this has occurred, neuropsychologists are dealing with other professions such as psychiatry, physical therapy, occupational therapy, speech pathology, recreation therapy and even driving schools in a way in which we have not related previously. These other professions are unsure of what skills we can bring to the overall rehabilitative process, and we as a profession are also unsure at times of the contributions which we can make. These situations and professional demands therefore lead toward two critical questions: How will neuropsychologists interface with rehabilitation programs to provide their unique contributions to treatment program development, and how can these contributions be best designed to answer the questions of validity which are becoming of increasing concern to scientific, political, and consumer bodies?

The focus of this paper is therefore to address these two questions. The first question as well as others were asked very specifically in the design of the overall head trauma service at the Baylor Institute for Rehabilitation. Baylor has worked with head injured patients for many years and over the past 18 months has developed a well thought out, operationally defined, comprehensive treatment approach to these problems. In order to answer such questions, a specific head trauma committee was organized with working representatives from each discipline. The hiring of full time clinical coordinator for the head injury service also made it

possible to begin to develop a truly interdisciplinary approach. Over the span of approximately one year, what could be generally characterized as an operational definition to a rehabilitation program was designed which addressed every aspect of care for the head injured patient and family including nursing care, medical management, nutrition, mobility skills, cognitive and communication functions, psychosocial considerations, and family intervention. Each of the above named areas were specifically designated as an operational category with each service clearly defining the types of programs and interventions within each category for the early, middle and late stages of recovery from head injury.

The dynamically evolving stages from head injury were also operationally defined using the Glasgow Coma Scale, the Galveston Orientation and Amnesia Test, and other operational definitions of cognitive as well as general functional ability. Once these operational definitions were completed, we had well defined guidelines for referral to the various specialities. For example, when is the best time to refer a head injured patient to psychology service? How long should that patient as well as the family be treated and by what method? What types of neuropsychological assessment are needed and at what stages? How can neuropsychological assessment be linked directly to both consultation to other services on the interdisciplinary team as well as linked directly to treatment intervention for cognitive remediation?

The contribution of the clinical neuropsychology service to the interdisciplinary team was developed over a period of 18 months very much like an operational definition. Operational stages were defined and criteria drawn for referral for cognitive functioning purposes, behavioral disturbances and behavioral management, personality difficulties, family counseling, sexual concerns, evaluation for the driving program (the Baylor Institute for Rehabilitation maintains the only licensed driving school in a rehabilitation facility in the north Texas area), as well as other issues. Because few head injured patients in a rehabilitative setting can successfully complete the entire Halstead-Reitan Neuropsychological Battery or other complex batteries, it became especially important to design a logical serial assessment sequence which has direct implication for treatment and consultative efforts.

The combination of the interdisciplinary team effort resulted in a document which is a coordinated operational definition to the development of a truly interdisciplinary team approach. This overall program is currently being developed into booklet form at our institution and will serve as guide for both professionals and families so that even family members can readily understand what each team member is doing in the overall approach to head injury at each stage of treatment. Of critical importance is the development of a serial assessment schedule in which patients are returned to the rehabilitaiton facility at intervals of six weeks, six months, and

one year post hospital discharge for increasingly more sophisticated neuropsychological assessment in order to insure the continuity of long term evaluation and care. Examples of this operational approach are given in the appendix.

The second question, that of the investigation of the validity of various treatment techniques, may seem like a new issue only on the surface. The question is really an old one; older then Eysenck, older than Freud or Pinel, even older than the Greeks who used suggestive and hypnotic therapies. And, aside from using a few approaches such as sociological methodology or computer simulations which may be new to or not frequently used by psychological researchers, the investigative techniques are mostly well known, also.

Questions such as "Does practice with computer games improve reaction time?" or "Will this perceptual-motor module increase function and result in employability?" are important questions. However, they fall into the same unanswerable category as "Are behavioral approaches superior to analytic?" or "Does surgery cure people?"

The following five categories of suggestions are therefore offered to the validity problem:

- Basic process and outcome methodology should be applied. Research questions should address the subsets of patients with what specific kinds of cognitive functions and who operate under what kinds of situational/environmental/cultural variables will respond to what types of operationally defined treatments and demonstrate what degrees of various outcomes (Garfield and Bergin, 1978)

- Treatment programs should operationalize the entire rehabilitation process as much as is possible to allow comparison, manipulation of independent variables, replication, and validation. The Baylor approach is a step in this direction.

- Meta-analyses and similar analytic techniques should be applied to outcome studies from various centers (Smith and Glass, 1977)

- Expectancy and placebo effects should not be neglected and should be investigated along with specific effects of direct treatment (Perotti and Hopewell, 1976)

- Novel methodologies must be employed with better teamwork with researchers from other disciplines. Sociological methodologies will prove useful in the investigation of complex sociological variables which can be of even more importance than the most intensive rehabilitation experience. Included in these specific effects will be the contribution of extra-rehabilitation mechanisms such as local long-term peer/volunteer support groups (Hopewell, Young, and Maixner, 1985).

- I predict also that investigations of both simulated intelligence and electrical/chemical/surgical brain interventions will become more commonplace and fruitful. Computers or robots with simulated intelligence (and simulated cognitive dysfunctions) may one day be put through simulated cognitive rehabilitation programs. And finally, innovations on the biochemical level will probably change the content, but not the process, of the questions we are addressing surely as quickly as we can begin to answer them.

In summary, therefore, the role of the neuropsychologist in rehabilitation is rapidly changing to that of program and treatment designer and implementer. Concurrently, questions regarding the validity of those programs and treatment interventions are being raised with increasing frequency and urgency. Using an objective definition approach to program development as well as the application of psychological developments in the field of psychotherapy research will enable the fruitful addressing of such issues.

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DEPARTMENT OF PSYCHOLOGY

HEAD TRAUMA PROGRAM

Early Phase:

Skill Area: Family Education / Participation Skills

1. Family education regarding cognitive, affective, and behavioral sequelae of head injury

2. Address family stress / Dysfunction

Middle Phase:

Skill Area: Family Education / Participation Skills

1. Family education regarding cognitive, affective, and behavioral sequelae of head injury

2. Family education and participation in behavioral management and training when necessary

3. Address family stress / Dysfunction

Skill Area: Psychological / Social

1. Functional behavioral, psychological and social patterns (patient)

2. Anticipatory Prevention

Late Phase:

Skill Area: Family Education / Participation Skills

1. Family education regarding cognitive, affective, and behavioral sequelae of head injury

2. Family education and participation in behavioral management and training when necessary

3. Address family stress / Dysfunction

Skill Area: Cognitive Skills

1. Increased information processing, mental competence, and overall cognitive functioning

Skill Area: Psychological / Social

1. Functional behavioral, psychological and social patterns (patient)

2. Anticipatory Prevention

Skill Area: Community Re-entry Skills

NOTE: This Appendix is for illustrative purposes only. The section chosen for illustration of Psychology Interventions is from the Late Phase of recovery and includes only the skill area: Cognitive Skills.

BAYLOR INSTITUTE FOR REHABILITATION

DEPARTMENT OF PSYCHOLOGY

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HEAD TRAUMA PROGRAM

LATE PHASE

SKILL AREA: Cognitive Skills

Goal: Increased information processing, mental competence, and overall cognitive functioning

Component: Cognitive evaluation as an ongoing neuropsychological assessment process

Assess Target Behaviors:

- Memory Skills
- Attention / Concentration
- Information processing
- Abstract reasoning / General Intelligence
- Problem solving
- Verbal fluency
- Academic Achievement Levels
- Perceptual-motor skills

Intervention:

Neuropsychological Assessment

Neurological Assessment is a specialty extension of the traditional psychological and neurological mental status exams. Specialized procedures are necessary in order to:

1. Make assertions regarding brain/behavior relationships, and, especially the function of the cerebral cortex.

2. Evaluate and measure dynamic changes in brain status and function

3. Aid in the planning of as well as the evaluation / validation of remediation techniques

4. Aid in prognosis

Neuropsychological Assessment will be accomplished in stages, from the initial informal, rating, and mental status examination stage to a formal assessment stage when brain functions are relatively stabilized. This serial evaluation is mandated by:

1. Dynamic nature of traumatic brain injury

2. Long term psychosocial and family consequences

3. Need for vocational and legal evaluation as well as prognosis

The Serial Assessment Schedule is attached. Definitions and classification of specific tests are included in the Appendix.

Component: Cognitive Remediation Techniques

Target Behaviors and Behavioral Links:

- Attention / Concentration
- Information processing
- Abstract reasoning
- Problem solving
- Memory skills
- Verbal fluency
- Perceptual-motor skills

Procedures: (Not inclusive)

- Medication consults to aid in medication titration. Psychotropic or other medications may alter attention, reality contact, agitation, etc. These may be done in conjunction with Psychiatry.



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- Memory Skill Training

  Association Skills
  Mnemonics
  Acronyms
  Stack-and-Link
  Method of Loci
  Organizational Skills
  Coding
  Reality Contact
  Imagery
  External aids
  Motor coding

- Computer Assisted Remediation Techniques

  (These will use a variety of software packages and will depend on processes taught rather than specific software). Behavioral links and strategies, rather than generic skills, will be emphasized.

  Visual Scanning
  Attention / concentration
  Visual Memory
  Problem solving / Mental flexibility
  Perceptual-motor skills
  Following directions / reliability
  Keyboard operations
  Reading and Number Concepts
  Map and topographical skills
  Behavioral initiation
  Behavioral monitoring and self correction
  Cognitive structuring
      SQ4R
      Scheduling
      Other techniques

  Assess and remediate various skills related to driving

- Behavioral Techniques to assist in:

  Structuring
  Functional Analysis of Behavior
  Structural Behavioral Program

Component: Mental Forensic Competency

Target Behaviors:

- Has capacity of informed consent:
  1. Mental capacity to use information to make decisions
  2. Can process information relevant to the decision in question
  3. Can resist coercion and engage in voluntary choice
- Has capacity to manage personal affairs
- Has capacity to manage personal financial affairs
- Has capacity to manage business affairs
- Has capacity to participate in legal proceedings

## CHI Late Phase Neuropsychological Assessment Schedule

| | * Abnormal GOAT score | Normal GOAT score but prior to D/C or OP clinic | Three Month Post / Injury Discharge | Six Month Post / Injury Discharge | One Year Post / Injury Discharge |
|---|---|---|---|---|---|
| PATIENT | | | | | |
| | Mental Status Exam | Mental Status Exam | Mental Status Exam | | |
| | | Informal Tests | Informal Tests | Formal Neuropsychological | Formal Neuropsychological |
| | | Mental Health Check - Up | Mental Health Check - Up | Mental Health Check - Up | Mental Health Check - Up |
| | Neurobehavioral Rating | Neurobehavioral Rating | Neurobehavioral Rating | Neurobehavioral Rating | Neurobehavioral Rating |
| FAMILY | Life Quality Assessment | Life Quality Assessment | Life Quality Assessment | Life Quality Assessment | Life Quality Assessment |
| | KATZ Sickness Impact Profile | | | | |

*Only if needed; normally deferred until normal GOAT scores achieved